UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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			EXAMINER
8791	7590	08/16/2006	LEE, CHUN KUAN

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Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 April 2006*.

2a)☒ This action is **FINAL.** 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-24* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *31 December 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

    1.☐ Certified copies of the priority documents have been received.

    2.☐ Certified copies of the priority documents have been received in Application No. _____.

    3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

FRITZ FLEMING
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100
8/15/2006

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

DETAILED ACTION

Response to Arguments

1.   Applicant's arguments with respect to claims 1-24 have been considered but are

moot in view of the new ground(s) of rejection. Currently claims 1-24 are pending for

examination.

Claim Objections

2.   Claim 6 is objected to because of the following informalities:

in claim 6, "the plurality of different communication protocols" should be replace

with - the plurality of different storage protocols -. Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

3.   Claims 1-3, 6, 9, 12, 14-15, 17-20 and 22-24 are rejected under 35 U.S.C. 103(a)

as being unpatentable over Wood et al. (US Patent 6,915,363) in view of Haymes et al.

(US Patent 6,645,383).

4.   As per claims 1, 9, 15 and 20, Wood teaches a system, a method, an article and

an apparatus comprising:

at least one storage protocol controller (system controller 314 of Fig. 3) capable

of communicating in accordance with a plurality of storage protocols (e.g. Serial ATA,

ATA/IDE, SCSI, USB, IEEE-1394 (Firewire), Fiber Channel and iSCSI) (col. 6, ll. 12-18

and col. 7, ll. 15-19), the at least one storage protocol controller being capable of being

coupled with a bus (Fig. 3, ref. 312);

a storage enclosure including a plurality of storage devices (Fig. 3, ref. 318, 330,

338, 342, 346, 350, 354), wherein two or more of the storage are combined in a

Redundant Array of Inexpensive Disk (RAID) configuration (col. 1, ll. 26-60), and each

storage is capable of communicating in accordance with one of Serial Attached SCSI

(SAS), Serial Advance Technology Attachment (SATA) and Fiber Channel (FC) storage

protocol (col. 6, ll. 12-18 and col. 7, ll. 15-19);

an intermediate device (Fig. 1, ref. 316, 324, 326) coupled between the storage

protocol controller and at least one of the plurality of storage devices, and capable of

communicating in accordance with a plurality of storage protocols (col. 7, ll. 15-19); and

an appropriate hardware, software, firmeware, logic and programming to be

utilized for the operation of the system (col. 6, ll. 55-65), wherein the software, firmware

and programming would have been stored in a storage medium to be executed.

Wood does not teach the system, the method, the article and the apparatus

comprising wherein the interface device including:

protocol sensing circuitry to determine which one of the plurality of storage

protocols the at least one storage device is capable of communicating, and

flow control circuitry to control a data stream between the at least one storage

device and the storage protocol controller, wherein the data stream includes the storage

protocol determined by the protocol sensing circuitry.

Haymes teaches a system and a method comprising an intermediate device (Fig.

1, ref. 102-106) including:

detection circuit (Fig. 2, ref. 210, 212) to determine which of a plurality of

protocols the received source data stream is utilizing (col. 1, l. 58 to col. 2, l. 58);

a phase lock loop (PLL) for controlling the flow of data stream in accordance to

the protocol detected by the detection circuit (col. 10, l. 54 to col. 11, l. 38); and

automatically detecting the protocol of the received source data stream and

setting the interface device accordingly so that the interface device may transfer data

streams in accordance to the detected protocol (col. 2, ll. 5-21 and col. 3, ll. 10-34),

therefore, the received source data stream would obviously include the necessary

information to be utilized by the detection circuit for the automatic determination of the

corresponding protocol.

It would have been obvious to one of ordinary skill in this art, at the time of

invention was made to include Haymes's detection circuit and PLL into Wood's

intermediate device. The resulting combination of the references teaches the system,

the method, the article and the apparatus comprising wherein the interface device

including:

the detection circuit to determine which one of the plurality of storage protocols is

utilized by the received source data stream transferred from the disk drives; and

the PLL to control the flow of data stream in accordance to the storage protocol

detected by the detection circuit, as the data stream is transferred from the disk drives

to the subsystem controller, wherein the source data stream would include the

necessary information to be utilized by the detection circuit to determine the

corresponding storage protocol.

Therefore, it would have been obvious to combine Haymes with Wood for the

benefit of enabling the changing of protocol without manual interaction and without

requiring a priori knowledge of the protocol used by the source (Haymes, col. 3, ll. 20-

23).

5.   As per claim 2, Wood and Haymes teach all the limitations of claims 1 as

discussed above, where Haymes further teaches the system and the apparatus

comprising wherein the intermediate device is further capable of detecting a .

predetermined initialization signal sequence indicative of a storage protocol (Haymes,

Abstract and col. 3, ll. 20-63), wherein initially the detection circuit would need to know

(i.e. predetermined) the signaling sequence of the corresponding storage protocol in

order to properly detect which one of the plurality of storage protocols is utilized by the

receiving data stream.

6.   As per claims 3 and 12, Wood and Haymes teach all the limitations of claims 2

and 11 as discussed above, where Wood further teaches the system and the apparatus

comprising wherein the predetermined signal sequence comprises an out-of-band

signal sequence (Wood, Fig. 3, ref. 325 and col. 7, 59-62).

7.   As per claims 6 and 14, Wood and Haymes teach all the limitations of claims 1

and 9 as discussed above, where Wood further teaches the system and the apparatus

comprising wherein the plurality of different storage protocols comprise a Fiber Channel

protocol, a Serial Attached Small Computer System Interface protocol, and a Serial

Advanced Technology Attachment protocol (Wood, col. 6, ll. 12-18 and col. 7, ll. 15-19).

8.   As per claims 17 and 22, Wood and Haymes teach all the limitations of claims 15

and 20 as discussed above, where Haymes further teaches the method and the article

comprising:

         receiving, by the intermediate device, an initialization signal sequence (Haymes,

Abstract and col. 3, ll. 20-63), wherein the initialization signal sequence would be the

received data stream as the intermediate device is initialized by the received data

stream when the detection circuit automatically determining which one of the

corresponding plurality of storage protocols is utilized; and

         selecting, by the intermediate device, at least one of the plurality of storage

protocols based on said initialization signal sequence (Haymes, Abstract and col. 3, ll.

20-63), wherein the selection is implemented automatically by the detection circuit as

the detection circuit determines which one of the plurality of storage protocols is utilized

by the receiving data stream from the disk drive and configures the intermediate device

accordingly to communicate in accordance to the detected storage protocol.

9.   As per claims 18 and 22, Wood and Haymes teach all the limitations of claims 15

and 20 as discussed above, where Haymes further teaches the method and the article

comprising:

   determining, by the intermediate device, a link frequency associated with said at

least one storage device (Haymes, col. 10, l. 63 to col. 11, l. 38), wherein the link

frequency is determined by the phase lock loop (PLL) within the clock data recovery

(CDR) as the PLL lock on the incoming frequency associated with the receiving data

stream; and

   communicating, by said intermediate device with said at least one storage device

using said link frequency (Haymes, col. 10, l. 63 to col. 11, l. 38), as PLL is locked on

the frequency of the incoming data stream, intermediate device may then communicate

in accordance to the locked frequency.

10.   As per claims 19 and 24, Wood and Haymes teach all the limitations of claims 15

and 20 as discussed above, where Haymes further teaches the method and the article

comprising:

   communicating, by the intermediate device with said at least one storage device

with a selected storage protocol among the plurality of storage protocols (Haymes,

Abstract and col. 3, II. 20-63), wherein the selection is implemented automatically by the

detection circuit as the detection circuit determines which one of the plurality of storage

protocols is utilized by the receiving data stream from the disk drive and configures the

intermediate device accordingly to communicate with the disk drive in accordance to the

detected storage protocol.

11.   Claims 4, 13, 16 and 21 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Wood et al. (US Patent 6,915,363) and Haymes et al. (US Patent

6,645,383), and further in view of Wong et al. (US Pub.: 2003/0035504).

Wood and Haymes teach all the limitations of claims 1, 9, 15 and 20 as

discussed above, where both further teach the system, the method, the article and the

apparatus comprising wherein:

the protocol sensing circuitry is also capable of receiving at least one of an out-

of-band signal sequence (Wood, Fig. 3, ref. 325 and col. 7, 59-62) and an analog burst

signal sequence (Haymes, col. 2, I. 49 to col. 4, I. 11); and

the intermediate device having the flow control circuitry comprises data tracking

circuitry (Haymes, phase lock loop (PLL) within clock and data recovery (CDR) 102 of

Fig. 1) capable of receiving the data stream from said at least one storage device

(Haymes, col. 10, I. 63 to col. 11, I. 38), wherein the PLL track the receiving data stream

by locking to the frequency of the receiving data stream to properly receive the data

stream.

Wood and Haymes does not teach the system, the method, the article and the apparatus comprising wherein:

the intermediate device having the flow control circuitry comprises data tracking circuitry capable of generating a clock signal indicative of the frequency of said data stream, and said flow control circuitry also comprising retimer circuitry capable of receiving said data stream and said clock signal and generating a retimed data stream; and

transmitting the retimed data stream to at least one of the at least one storage protocol controller and the at least one of said plurality of storage device.

Wong teaches a system and a method comprising a retimer including a clock and data recovery (CDR) circuit configured to recovery a clock from a received data stream and reclock the data ([0016]).

It would have been obvious to one of ordinary skill in this art, at the time of invention was made to include Wong's retimer into Wood and Haymes' interface device. The resulting combination of the references teaches the system, the method, the article and the apparatus comprising wherein:

the intermediate device including the retimer, wherein the CDR would recover (i.e. generate) the clock frequency of the receiving data stream; and

the retimer receiving the data stream and the clock signal and reclock the data to be transmitted (i.e. generating a retimed data stream), wherein the reclocked data may be transferred to the at least one of the at least one storage protocol controller and the at least one of said plurality of storage device.

Therefore, it would have been obvious to combine Wong with Wood and Haymes

for the benefit of transmitting a cleaner data stream by utilizing a clean retimer clock

free from jitter (noise) (Wong, Abstract; [0009]-[0010] and [0017]).

12.   Claims 5, 7 and 10-11 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Wood et al. (US Patent 6,915,363) and Haymes et al. (US Patent

6,645,383), and further in view of "Parallel vs. Serial ATA".

Wood and Haymes teach all the limitations of claims 1 and 9 as discussed

above, where both further teach the system and the apparatus comprising:

the intermediate device is capable of being coupled to said at least one storage

device (Wood, Fig. 3, ref. 328, 334, 340, 344, 348, 352, 356), communicate utilizing at

least one of said storage protocols (Wood, col. 6, l. 12-18 and col. 7, ll. 15-19);

the intermediate device (Wood, Fig. 3, ref. 316, 324, 326) is coupled to said

storage protocol controller (Wood, Fig. 3, ref. 314) and said at least one of the plurality

of storage devices (Wood, Fig. 3, ref. 316, 330, 338, 342, 346, 350, 354); and

intermediate device is further capable of detecting a predetermined initialization

signal sequence indicative of at least one of said plurality of storage protocols (Haymes,

Abstract and col. 3, ll. 20-63), wherein initially the detection circuit would need to know

(i.e. predetermined) the signaling sequence of the corresponding storage protocol in

order to properly detect which one of the plurality of storage protocols is utilized by the

receiving data stream.

Wood and Haymes does not expressly teach the system and the apparatus

comprising the utilizing of at least one cable to coupled the intermediate device to the at

least one storage devices and to the storage protocol controller, wherein the cable is

compatible with at least one of the plurality of storage protocols.

Parallel vs. Serial ATA teaches a system and a method comprising a cable (bus)

coupling the hard drive to the motherboard, wherein the cable is compatible with the

storage protocol utilized by the hard drive (Fig. 2 on page 3 and Fig. 5-6 on page 5).

It would have been obvious to one of ordinary skill in this art, at the time of

invention was made to include Parallel vs. Serial ATA's cable into Wood and Haymes'

system and apparatus. The resulting combination of the references teaches the system

and the apparatus comprising the intermediate device couple to the storage protocol

controller and the storage device utilizing one or more cables, wherein the cable would

conform to the storage protocol utilized by the storage device.

Therefore, it would have been obvious to combine Parallel vs. Serial ATA with

Wood and Haymes because it is well know to one skilled in the art regarding the use of

the cables to interconnect hardware devices within the computer system in order for

enable proper transferring of data between the hardware devices.

13.   Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wood et

al. (US Patent 6,915,363) and Haymes et al. (US Patent 6,645,383), and further in view

of "Fiber Channel Tutorial".

Wood and Haymes teach all the limitations of claim 1 as discussed above, where both further teach the apparatus comprising wherein the intermediate device further comprises protocol control circuitry capable of receiving a signal (e.g. source data stream) from said at least one storage device (Haymes, col. 2, ll. 5-21); and

wherein the received signal conforms to the Fiber Channel protocol (Wood, col. 6, ll.12-18 and col. 7, ll. 15-19).

Wood and Haymes does not expressly teach the apparatus comprising the intermediate device generating an acknowledge signal to be transmitted to said at least one storage device in response to the received signal.

Fiber Channel Tutorial teaches the system amd method comprising when destination receives a frame (e.g. signal), an ACK frame (i.e. acknowledge signal) is returned to the source (Flow Control Section on page 9).

It would have been obvious to one of ordinary skill in this art, at the time of invention was made to include Fiber Channel Tutorial's ACK frame into Wood and Haymes' apparatus. The resulting combination of the references teaches the apparatus comprising the intermediate device generating the ACK frame in response to the received signal from the at least one storage device.

Therefore, it would have been obvious to combine Fiber Channel Tutorial with Wood and Haymes because Wood and Haymes' apparatus utilized the Fiber Channel protocol for communication, therefore Wood and Haymes' apparatus must conforms to the standard utilized by the Fiber Channel protocol.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chun-Kuan (Mike) Lee whose telephone number is (571) 272-0671. The examiner can normally be reached on 8AM to 5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Fritz M. Fleming can be reached on (571) 272-4145. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

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For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

USPTO Customer Service Representative or access to the automated information

system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

C.K.L.
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